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| 10/597,525      | 08/12/2008  | Russell Keene        | W-355-6-7-02        | 2337             |

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| EXAMINER |
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SPORER, ERIC NOLAN

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3753

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03/16/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                     |  |
|------------------------------|--------------------------------------|-------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/597,525 | <b>Applicant(s)</b><br>KEENE ET AL. |  |
|                              | <b>Examiner</b><br>ERIC SPORER       | <b>Art Unit</b><br>3753             |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>28 July 2006, 29 August 2008</u> .                            | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9, 11-13, 15, 18-27, 32-35, 37-49, 54-56 and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by Paul et al. (US 5,320,139).

3. Regarding claims 1-9, Paul et al. disclose a pin valve assembly (see Fig. 3) comprising: a pin block housing 116 a valve pin 89; a fluid plate 111 with a fluid channel 110 for fluidically communicating with the valve pin; a fitting block 116 housing a fitting 85 for fluidic communication with the fluid plate and for fluidic communication with fluidic components

4. Regarding claim 2, Paul et al. further disclose a fitting port 99, aligned with the fitting, and a pin valve seat (surface upon which valve pin 89 seals, see Fig. 3), aligned with the valve pin 89.

5. Regarding claim 3, Paul et al. further disclose wherein the fitting port 99 is integrated into the fluid channel (see Fig. 3) of the fluid plate 111.

6. Regarding claim 4, Paul et al. further disclose wherein the pin valve seat (upper surface of plate 111 upon which the pin seals) is integrated into the fluid channel of the fluid plate,

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7. Regarding claim 5, Paul et al. further disclose wherein the fitting port 99 is integrated into the fitting 85.

8. Regarding claim 6, Paul et al. further disclose a pin valve seat 86 that is integrated into the pin valve

9. Regarding claims 7, Paul et al. further disclose wherein the fitting block is coupled to the pin block with the fluid plate positioned between the pin block and fitting block (see Fig. 3)

10. Regarding claim 8, Paul et al. further disclose wherein the fitting block is coupled to the pin block by a screw connection 112/113.

11. Regarding claim 9, Paul et al. further disclose wherein, the pin valve comprises a pin 89 with distal and proximal ends substantially axially disposed in a housing 116.

12. Regarding claim 11, Paul et al. further disclose wherein the valve pins are actuated by an actuator 80/81 to provide for a distal end of the valve pin to sit in a pin valve seat substantially sealing the fluid channel and removing the distal end of the pin valve from the pin valve seat opening the fluid channel.

13. Regarding claim 12, Paul et al. further disclose wherein the pin blocks house six pin valves substantially equidistant from each other around the circumference of the pin block aligned with six pin valve seats on the fluid plate (see Fig. 4 and Col. 7 Lines 7-16).

14. Regarding claim 13, Paul et al. further disclose wherein the pin valve comprises a ring seal 87 above the distal end of the pin 89 and within a pin housing 116 for providing sealing of the fluid plate 111.

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15. Regarding claim 15, Paul et al. further disclose wherein each valve pin 89 is in a housing 116 comprising an actuator 90 for axially moving the valve pin to sit on the plate valve seat and substantially block fluid flow from a downstream location or remove the pin valve seat and provide for fluid flow to the downstream location.

16. Regarding claims 18-19, Paul et al. disclose a pin valve assembly (see Fig. 3) comprising: a pin block housing 116 a valve pin 89; a fluid plate 111 with a fluid channel 110 for fluidically communicating with the valve pin; a fitting block 116 housing fittings 85/95 for fluidic communication with the fluid plate and for fluidic communication with fluidic components 116.

17. Regarding claim 20, Paul et al. further disclose a fitting port 99, aligned with the fitting, and a pin valve seat (surface upon which valve pin 89 seals, see Fig. 3)), aligned with the valve pin 89.

18. Regarding claim 21, Paul et al. further disclose wherein the fitting port 99 is integrated into the fluid channel (see Fig. 3) of the fluid plate 111.

19. Regarding claim 22, Paul et al. further disclose wherein the pin valve seat (upper surface of plate 111 upon which the pin seals) is integrated into the fluid channel of the fluid plate.

20. Regarding claim 23, Paul et al. further disclose wherein the fitting port 99 is integrated into the fitting 85.

21. Regarding claim 24, Paul et al. further disclose a pin valve seat 86 that is integrated into the pin valve.

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22. Regarding claim 25, Paul et al. further disclose wherein the valve pins 89/86 impinge on the pin valve seat with which is aligns and substantially block the flow of fluid through the fluid channel 100 of the fluid plate 111.

23. Regarding claim 26 and 37, Paul et al. further disclose wherein each valve pin 89 is housed in a standardized housing (see housings of 80/81, Fig. 3) comprising a means 90 for actuation for axially moving the valve pin to sit on the pin valve seat and substantially block fluid flow from a downstream location or remove the pin from the pin valve seat and provide for fluid flow to the down stream location.

24. Regarding claims 27, Paul et al. further disclose wherein the valve pin housing is releasably fitted to the pin block by screws 112/113.

25. Regarding claim 32, Paul et al. further disclose the fitting block is coupled to the pin block with the fluid plate positioned between the fitting block and the pin block (see Fig. 3

26. Regarding claim 33, Paul et al. further disclose wherein the pin valve comprises a valve pin 89 with distal and proximal ends substantially disposed in a housing (see housing of parts 80 and 81, Fig. 3).

27. Regarding claim 34, Paul et al. further disclose wherein the valve pins are actuated by an actuator 80/81 to provide for a distal end of the valve pin to sit in a pin valve seat substantially sealing the fluid channel and removing the distal end of the pin valve from the pin valve seat opening the fluid channel.

28. Regarding claim 35, Paul et al. further disclose wherein the actuator is pneumatically operated (pneumatic actuation disclosed in Abstract).

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29. Regarding claim 38, Paul et al. disclose a pin valve assembly (see Fig. 3) comprising: a pin block housing 116 pin valves 80/81 with pin valve seats; a fluid plate 111 with a fluid channel 110 having channel ends (see Fig. 3); a fitting block 116 housing fittings 97/98/99/120 with fitting ports 99/120 in fluid communication with the pin valve seats and for fluidic communication with fluidic components..
30. Regarding claims 39, Paul et al. further disclose wherein the fitting ports 99/120 are integrated into the fluid plate 111.
31. Regarding claim 40, Paul et al. further disclose wherein the fitting ports (bores of 97/98) are integrated into the fittings.
32. Regarding claim 41, Paul et al. further disclose wherein the valve pins 89 are aligned with the channels of the fluid plate 111.
33. Regarding claim 42, Paul et al. further disclose wherein the channels of the fluid plate comprise six channels with ends (se Fig. 4).
34. Regarding claim 43, Paul et al. further disclose wherein the pin valves align with two channel ends of the fluid plate (see Fig. 3)
35. Regarding claim 44, Paul et al. further disclose wherein the pin valve seats comprise a first passage for fluidic communication with a channel end (upper end of 99) and a second passage for fluidic communication with another channel end (end of channel 100, see Fig. 3).
36. Regarding claim 45, Paul et al. further disclose wherein the pin valves comprise a pin 89 for substantially blocking fluidic communication between the first and second passage of the pin valve seat.

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37. Regarding claim 46, Paul et al. further disclose wherein the pin is actuated to block the first and second passage of the pin valve seat by an actuator 80/81.

38. Regarding claim 47, Paul et al. further disclose wherein the actuator is actuated pneumatically (pneumatic actuation disclosed in Abstract).

39. Regarding claim 48, Paul et al. further disclose wherein the valve pin comprises a pin for substantially blocking fluidic communication between the pin valve seat (upper surface of the fluid plate upon which the valve seats) and the fluid plate's channels.

40. Regarding claim 49, Paul et al. further disclose wherein each valve pin is housing in a standardized housing (see Fig. 3) releasably fitted to the pin block 116 (housing stop 92 can be removed from pin block).

41. Regarding claim 54, Paul et al. further disclose wherein the fitting block is coupled with the fluid plate 111 positioned between the pin block and the fitting block (see Fig. 3).

42. Regarding claim 55, Paul et al. further disclose wherein the valve pins are actuated by an actuator 80/81 to provide for a distal end of the valve pin to sit in a pin valve seat substantially sealing the fluid channel and removing the distal end of the pin valve from the pin valve seat opening the fluid channel.

43. Regarding claim 56, Paul et al. further disclose wherein the actuator is pneumatically operated (pneumatic actuation disclosed in Abstract).

44. Regarding claim 58, Paul et al. disclose a method of controlling the flow of a fluid comprising: providing a fluid plate 111 with a connected fluid channel 101, intersecting pin valve seats (top surface of plate upon which valve pins sit), and fluidic fitting ports



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99/120; supplying fluid to the fluid channel from a fluidic component 98 in communication with the fluidic fitting ports moving the fluid by use of the fluidic components; and sealing the fluid channel at selected pin valve seats by impinging on the seats with corresponding valve pins.

***Claim Rejections - 35 USC § 103***

45. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

46. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paul et al. in view of Cooper et al. (US 5,713,333)

47. Regarding claim 10, Paul et al. disclose the claimed invention except wherein the distal end of the pin has a diamond-like carbon coating. Cooper et al., however, teach the use of amorphous (diamond-like) carbon coatings of moving parts of valves for the purpose of providing low coefficients of friction and high thermal expansion coefficients and high hardness similar to that of ceramics (Col. 8 Lines 3-9). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the pin disclosed by Paul et al. so that the distal end has a diamond-like carbon coating, as taught by Cooper et al., valves for the purpose of providing low coefficients of friction and high thermal expansion coefficients and high hardness similar to that of ceramics.

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48. Claims 14, 16-17, 36 and 57, and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul et al. in view of Hauck.

49. Regarding claims 14, 36, 57 and 59, Paul et al. disclose the claimed invention except wherein the fluidic components are an HPLC system pump syringe, pump, column sample loop and sample syringe. Hauck, however, teaches that a "typical environment" in which selector valves are used in an HPLC system with fluidic components including HPLC system pump syringe (Col. 1 Lines 30-32), pump 34, column 42, sample loop 103 and sample syringe 39. Given that the Hauck teaches that an HPLC system pump syringe, pump, column sample loop and sample syringe are a typical HPLC environment, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the fluidic components disclosed by Paul et al. to comprise an HPLC system pump syringe, pump, column sample loop and sample syringe, as taught by Hauck, for the purpose of using the fluid delivery system in a liquid chromatography application.

50. Regarding claims 16-17, Paul et al. discloses a sleeve load seal 87 and pin seals 86. Paul et al. fail to disclose a belleville spring, and a nut seal around a distal end of a pin below a load ring, and a second belleville spring and a nut above the load ring and the pin seals are two polyetheretherketone washers surrounding a polytetrafluoroethylene washer. Hauck, teaches the use of a seal for pin 27 which comprises a belville spring, a nut seal around a distal end of the pin 27 (which would be under the lower end of a load ring when installed upwardly as see in Figs. 14-15), wherein the pin seals are two washers surrounding another washer (see Fig. 2). Given

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the teaching of the claimed sealing system in a similar multi-route selector valve system, it would have been obvious to modify the sealing system disclosed by Paul et al. to comprise a belleville spring, and a nut seal around a distal end of a pin below a load ring, wherein the pin seals are two washers surrounding another washer, for the purpose of providing a suitable seal. Furthermore, the claimed arrangement does not provide any unexpected results in comparison to the system disclosed by Paul et al. and is merely a functional alternative.

Regarding the limitation of there being a second belville spring and nut, these limitations are mere duplicates of the first spring and nut. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a second spring and nut, for the purpose of providing further support and force on the pins, since It has been held that mere duplication of the essential working parts of a device involves only routine skill in the art.

Regarding the limitation wherein the washers are polyetheretherketone (PEEK) surrounding polytetrafluoroethylene (PTFE), it would have been obvious to modify the washers to be made of these materials, as PEEK is a well known non-corroding and low friction material, and PTFE is a well known sealing and shock absorbing material. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

51. Regarding claim 60, Hauck further teaches wherein during a load stage the fluid channel is open for fluidic communication from the sample syringe through the sample

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loop and from the sample loop through the system syringe; and during an inject stage the fluid channel is open for fluidic communication from the pump through the sample loop and from the sample loop through the column (see Col. 1 lines 37-43). Although Hauck fails to explicitly teach that during the load stage the fluid channel is sealed from fluidic communication from the sample loop to the pump, from the sample loop to the column and from the sample syringe to the pump syringe and during the inject stage the fluid channel is sealed from fluidic communication from the pump through the column and from the sample syringe through the sample loop and from the sample loop through the pump syringe, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to seal off undesired flow paths.

52. Regarding claim 61, Hauck further discloses wherein during a load stage the pin valves provide for a fluid sample to be transferred from the sample syringe and loaded into the sample loop by a pressure difference created by the syringe 39 (Col. 1 Lines 38-39) and during an inject stage the pin valves provide for the sample to be injected from the sample loop into the column by a pressure difference created by the pump (high pressure is disclosed, in the inject position the only pressure source is the pump).

53. Claims 28-31 and 50-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul et al. in view of Wylie et al. (US 5,950,674) and Achener et al. (US 4,045,343)

54. Regarding claims 28-31 and 50-53, Paul et al. disclose the claimed invention except wherein the fluid plate is stainless steel with a flat tetrafluoroethylene (TFE) shim/coating on its surface that is impinged by the pin and the fitting block. Wylie et al,

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however, teach the use a selector valve having fluid plates 120 which are made of stainless steel coated with a highly inert material for the purpose of providing a strong non-corroding part for application in which the controlled fluid must come into contact with inert materials. Achener et al. teach that Teflon (a trade name of PTFE) is a tough flexible material that is self lubricating (Col. 10 Lines 31-44). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the fluid plate disclosed by Paul et al. to be stainless steel with a flat coating, as taught by Wylie et al., on its surface that is impinged by the pin and the fitting block, wherein the coating is tetrafluoroethylene (TFE), as taught by Achener et al., for the purpose of providing a strong non-corroding part that is tough, flexible and self lubricating, for application in which the controlled fluid must come into contact with inert materials.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIC SPORER whose telephone number is 571-270-7834. The examiner can normally be reached on Monday - Friday, 9 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on (571)272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ERIC SPORER/  
Examiner, Art Unit 3753

/Robin O. Evans/  
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